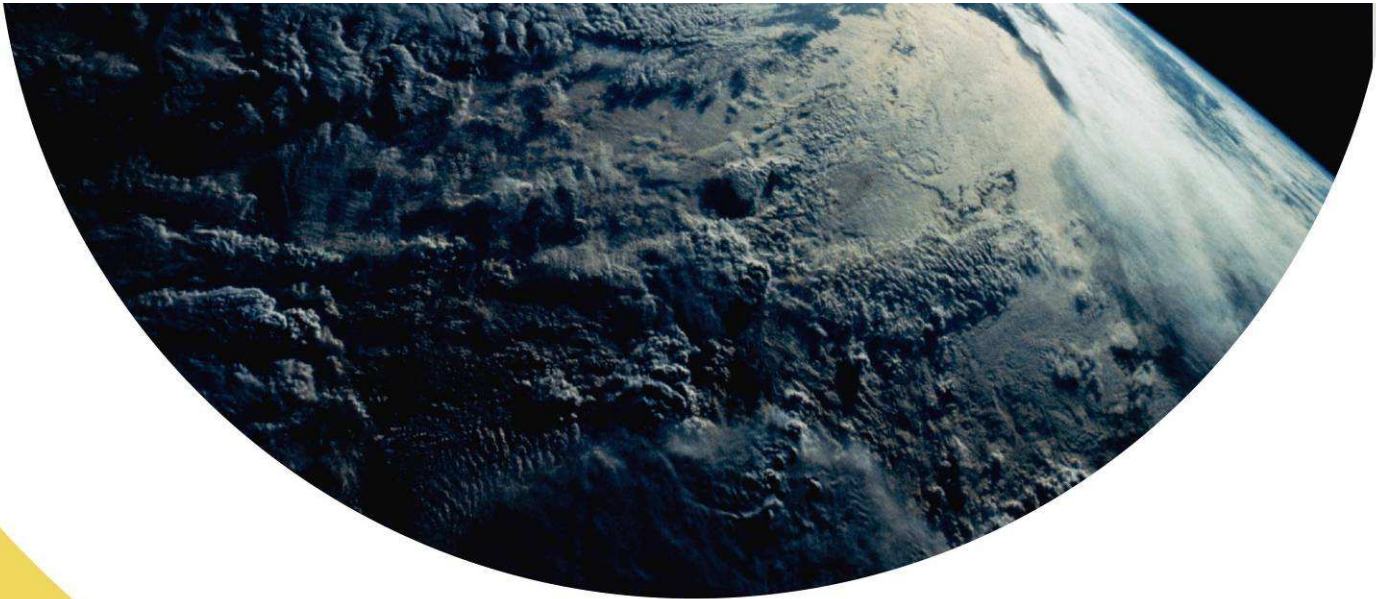




Global Monitoring for Environment and Security



Mauro FACCHINI
GMES Bureau

Sofia, 25-26 March 2010





Priorities of European Space Policy

- **Flagship applications of European Space Policy**

- 1) **Galileo**

The European initiative for a state-of-the-art global navigation satellite system, providing a guaranteed global positioning service under civilian control (constellation of satellites)



- 2) **GMES**

The European initiative for global monitoring for environment and security purposes, integrating space-based and in situ applications and services (pre-existing infrastructure + 5 new Sentinel families of satellites)



⇒ Develop adequate funding instruments & schemes

What is GMES?

- Global Monitoring for ENVIRONMENT and SECURITY
- An independent earth observation system for Europe
- The largest fleet of satellites and atmosphere/earth-based monitoring instruments in the world
- An end user-focused program of services for environment and security
- Joined-up information for policymakers, scientists, businesses and the public
- Europe's response to the global need for environment and climate monitoring

EU Added value

- Relevance of EU level taking into account subsidiarities
- Overall “information chain”: from observation to information required by the users
- “System of systems”: mutualisation & long term sustainability of capacities & resources
- Build on existing capacities in MS

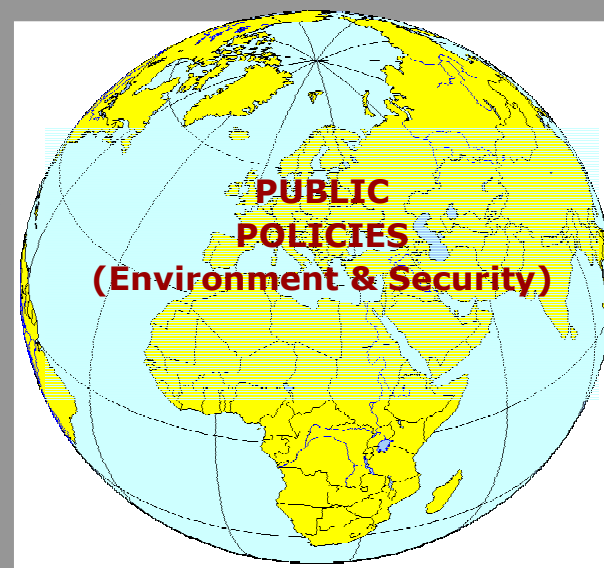
What is the objective?

...to provide information services
to policy-makers and other users



Space Agencies
In-situ Observing systems
Scientific Community
EO Value Adding Industry

Information
→
←
Needs
(policy driven)

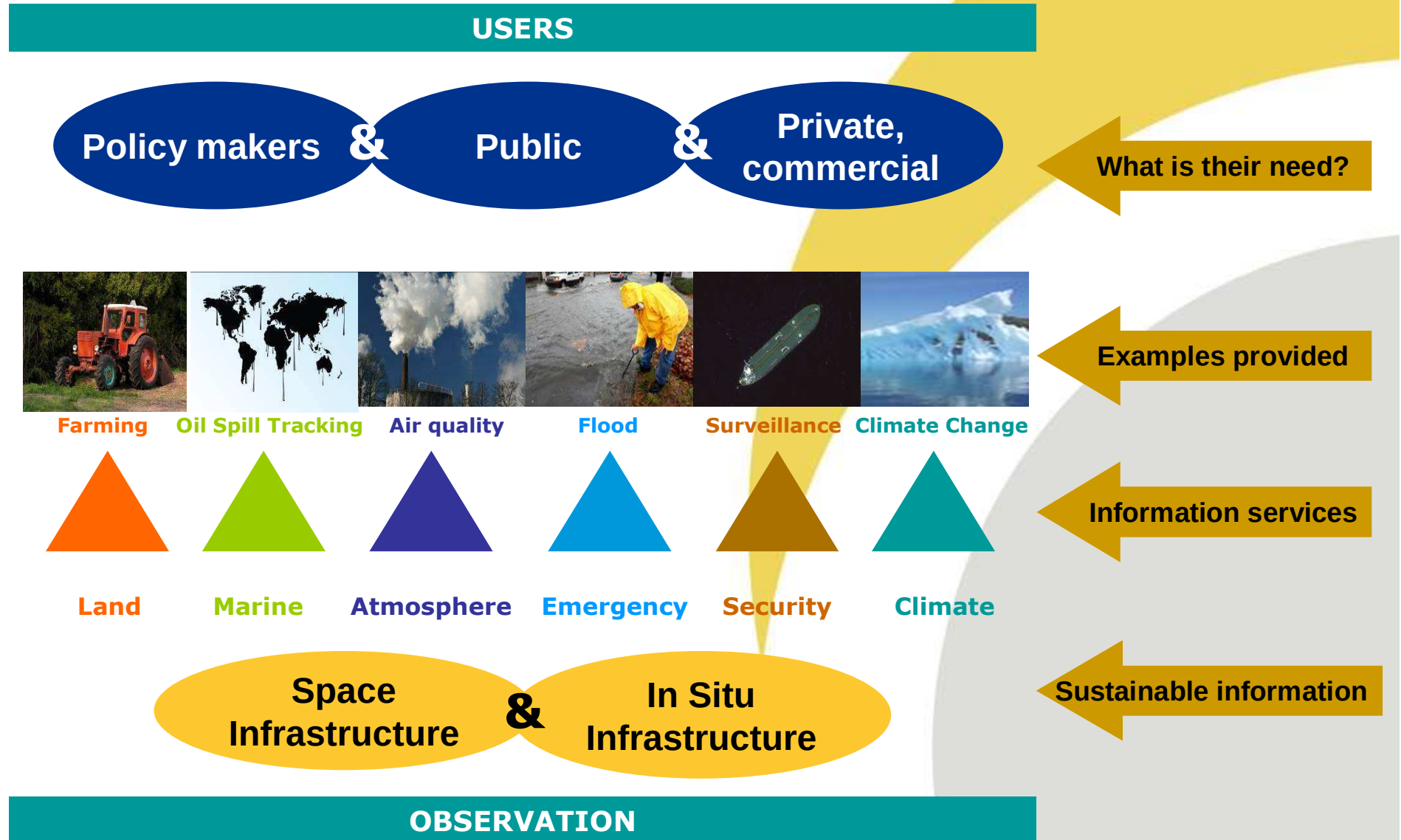


National Governments and Agencies
European Union Institutions
Inter Governmental Organisations (IGOs)
Non Governmental Organisations (NGOs)

Some key milestones

1998	Initiation of GMES, Baveno Manifesto
2000	Gothenburg EU Summit "establish by 2008 an operational European capacity for ... GMES"
2001+	Investments by ESA and EC on services
2005	GMES becomes 'flagship' of the European Space Policy ESA C-MIN in Berlin approves GMES Space Component programme
2006	GMES Bureau creation 1,2 B€ in the period 2007-2013
2008	EC-ESA agreement on GMES signed GMES services presented at Lille Forum
2009	Commission proposal for a GMES Programme Regulation Commission Communication on the GMES Space component
2010	EP and EU Council decisions; Preparation of the operations
2012+	Launch of first GMES Sentinels

GMES Overall View



GMES Components

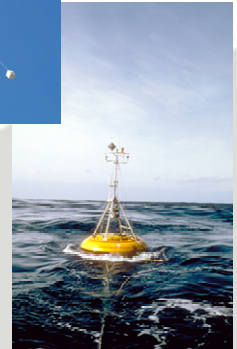
GMES is an EU led initiative

In-situ component – coordinated by EEA

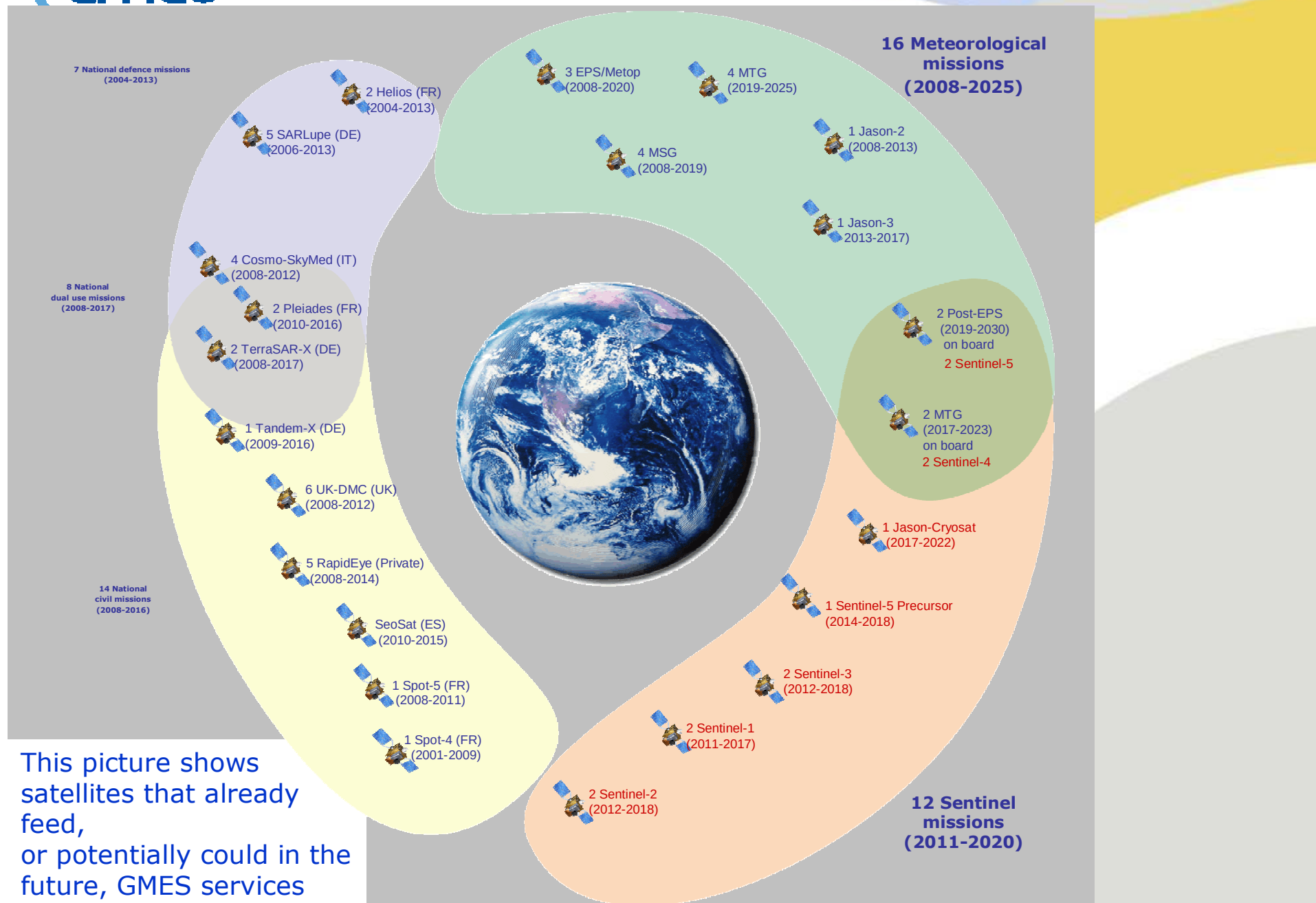
- Observations mostly within national responsibility, with coordination at European level
- air, sea- and ground-based systems and instruments

Space Component – coordinated by ESA

- Sentinels - EO missions developed specifically for GMES:
- Contributing Missions - EO missions built for purposes other than GMES but offering part of their capacity to GMES (EU/ESA MSs, EUMETSAT, commercial, international)



GMES space component



This picture shows satellites that already feed, or potentially could in the future, GMES services

GMES Services

Monitoring of Earth systems



Land



Marine



Atmosphere

Horizontal applications



Security



Emergency

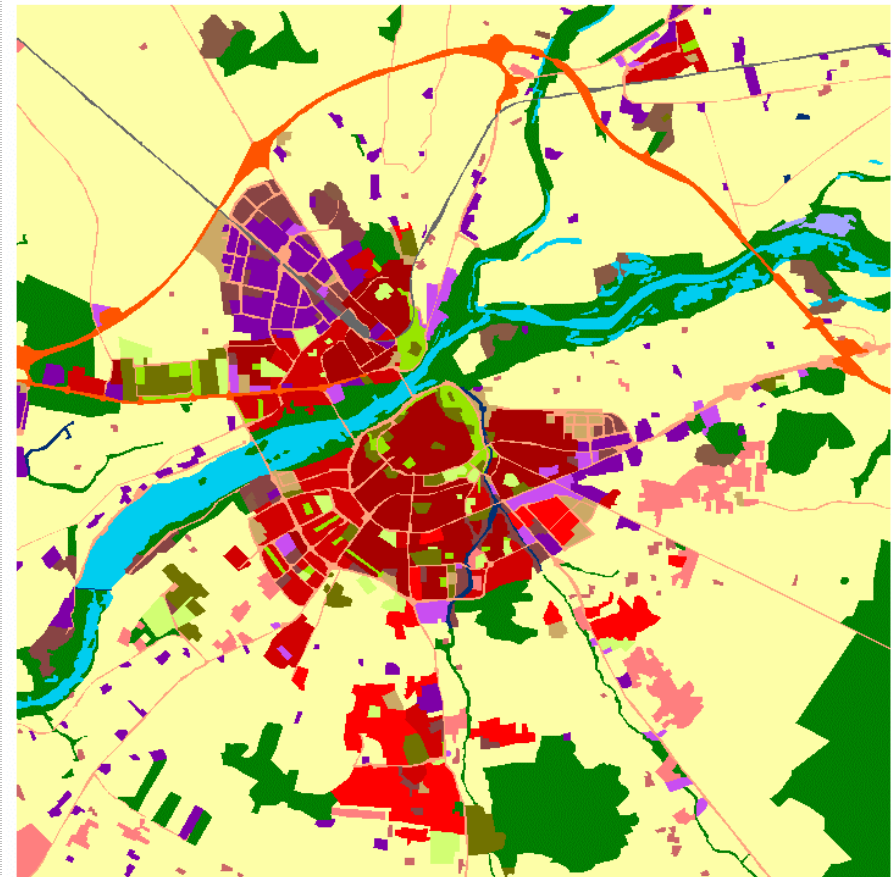


Climate Change

Land



- Land use
- Forests
- Urban planning
- Water quality
- Crop production
- ...

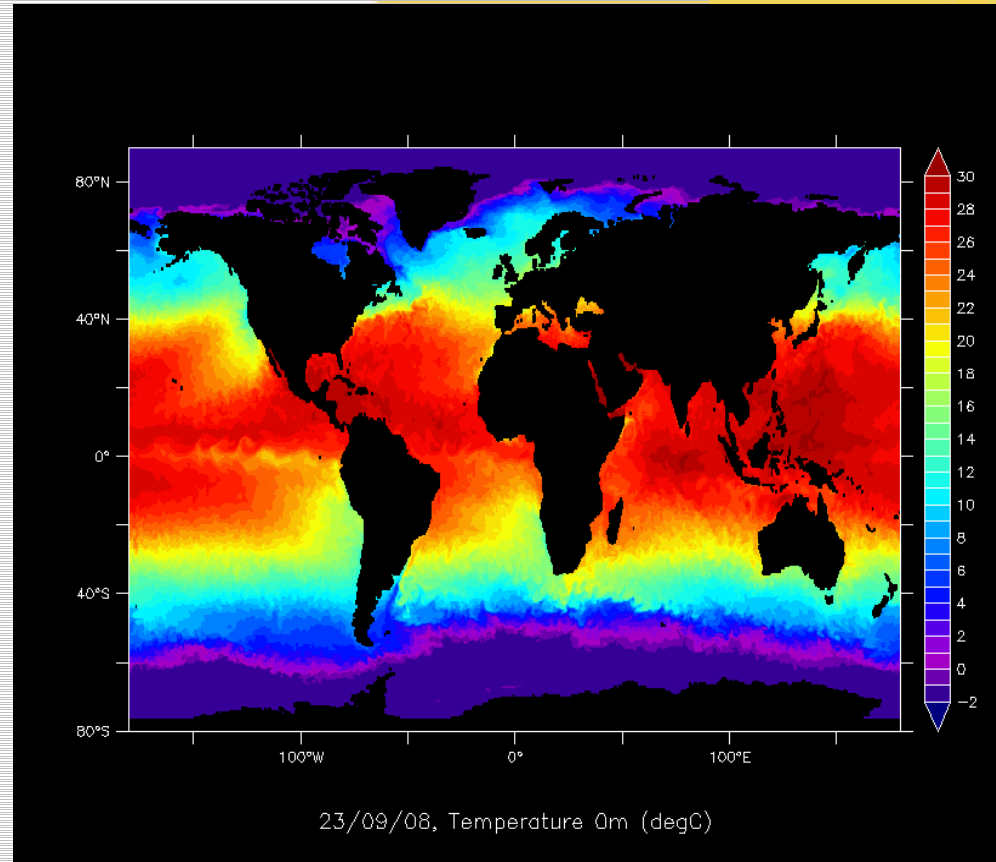


Urban Atlas

Marine

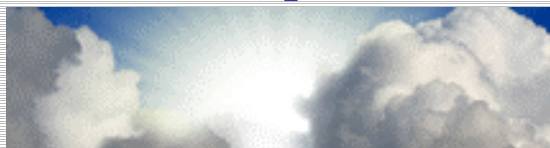


- Maritime transport
- Ocean resources
- Sea temperature
- Sea level rise
- Oil spill monitoring
- ...



Sea surface temperature

Atmosphere

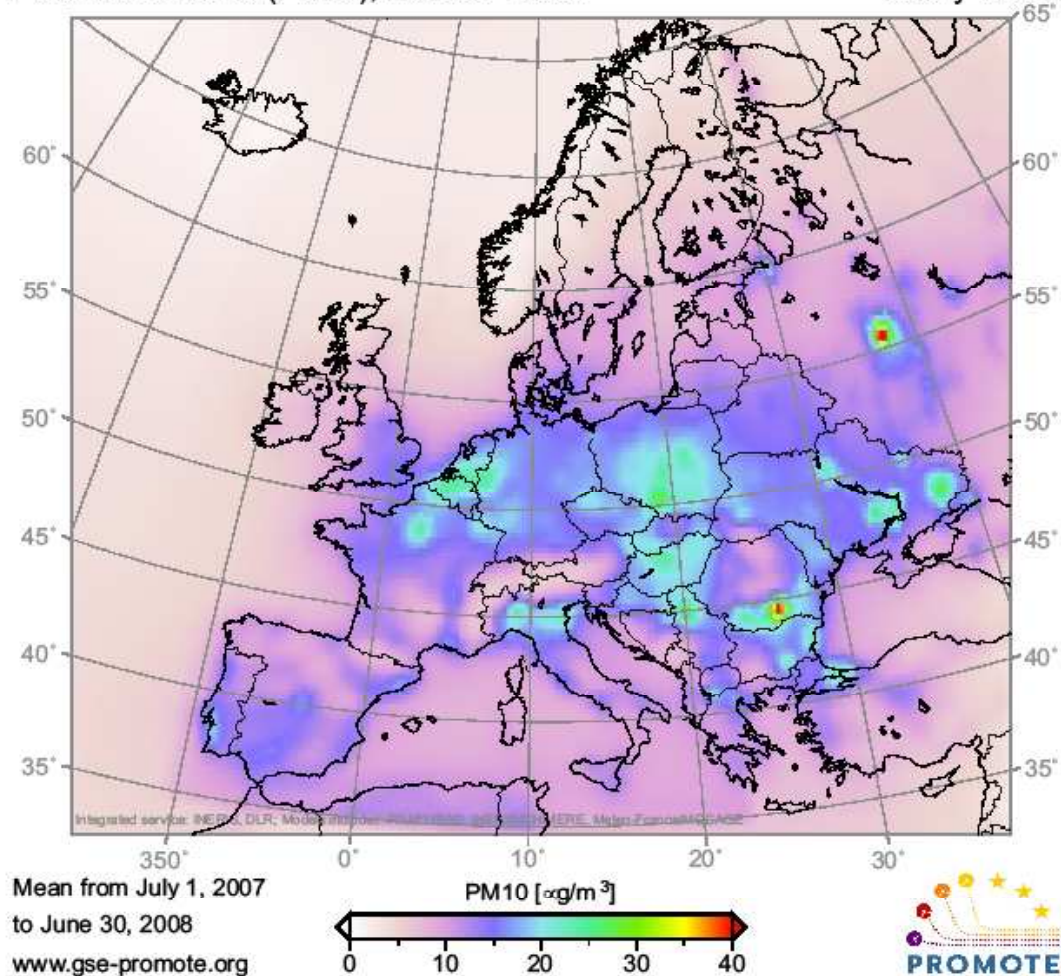


- UV monitoring
- Solar radiation
- Air quality
- Aerosols
- Ozone
-

Integrated Air Quality Ensemble
Particulate Matter (PM10), Surface Level

July 2007 to June 2008

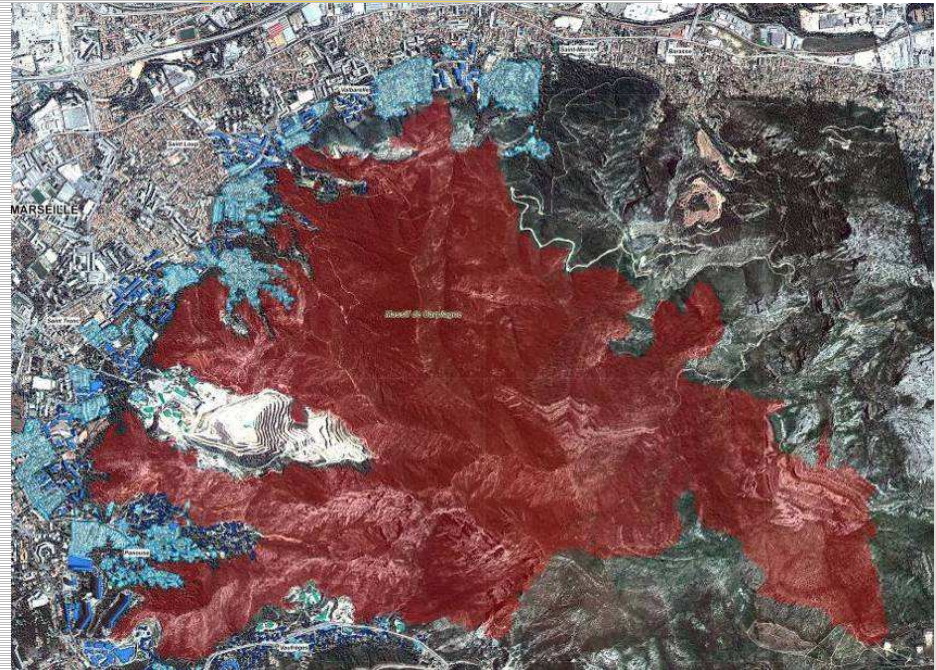
Yearly Mean



Emergency

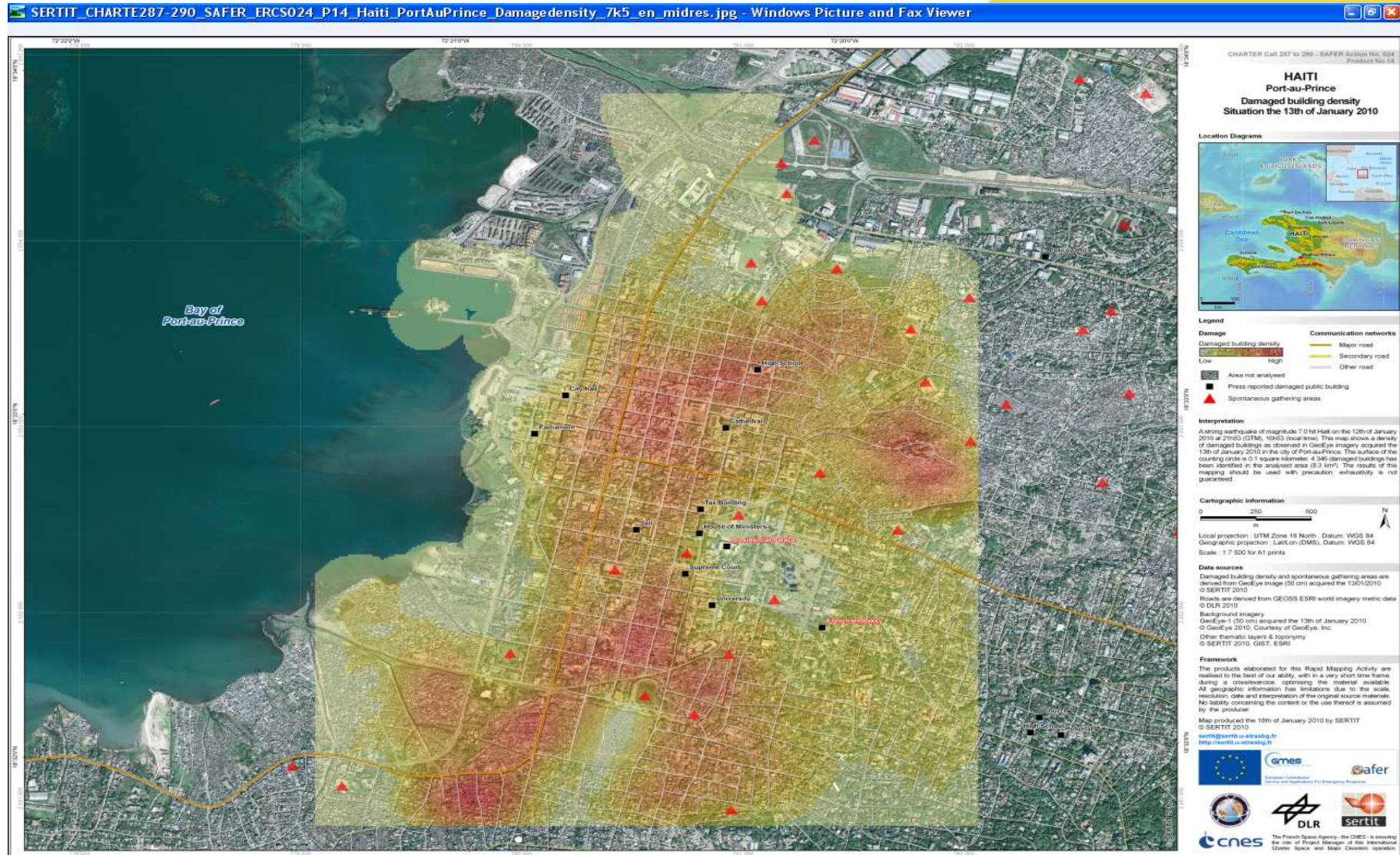


- Floods
- Fires
- Earthquakes
- Tsunamis
- Land slides
- ...

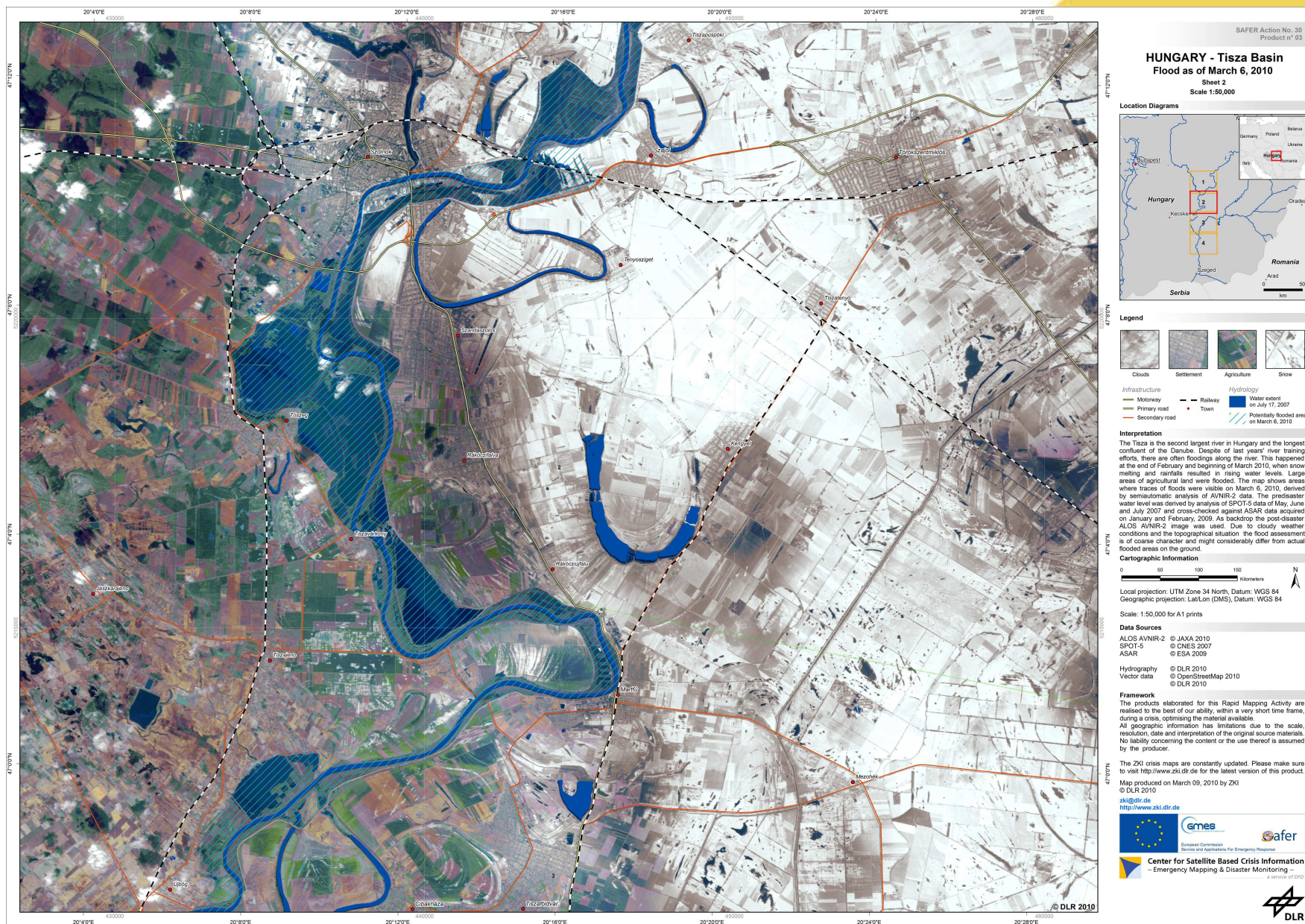


Extension of burnt ares

Port-au-Prince Damaged building density Situation the 13th of January 2010



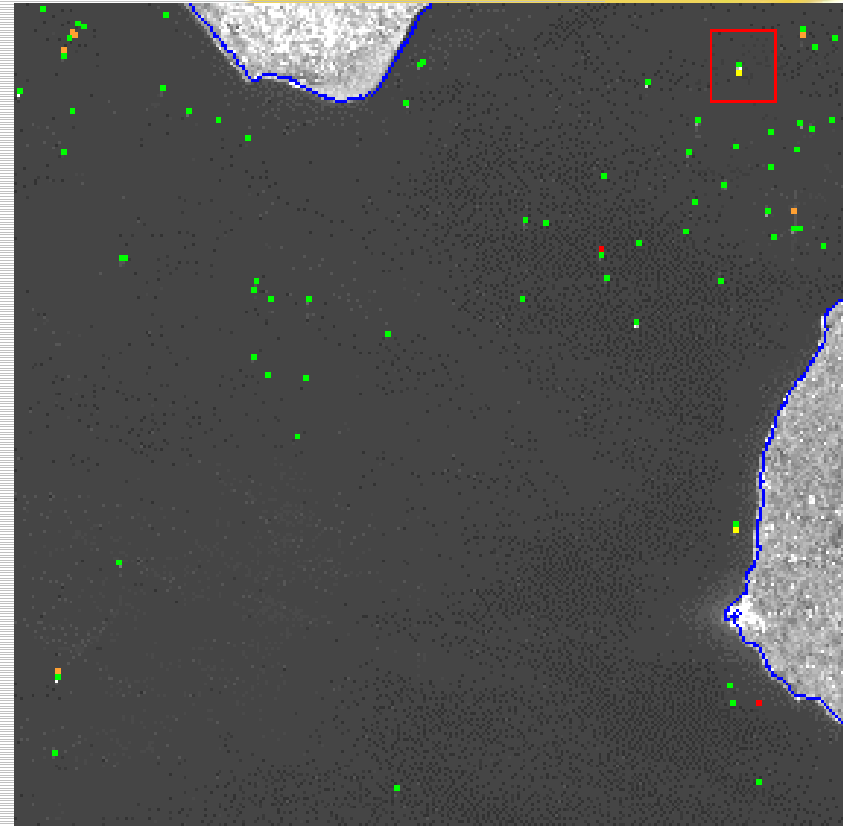
HUNGARY FLOOD, Tisza Basin 6 March 2010



Security



- Maritime surveillance
- Border control
- External actions
- Civil security
- ...

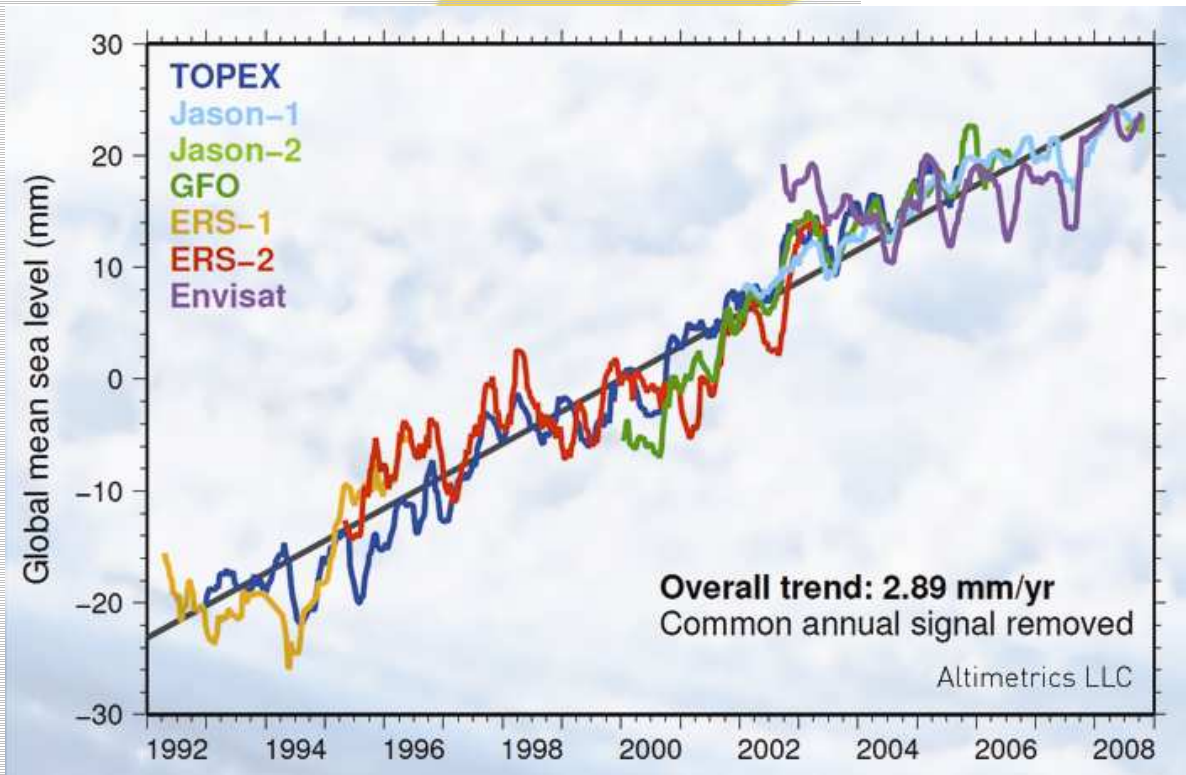


Cross-correlation of active and passive information

Climate Change



- Adaptation
- Mitigation
- Simulation
- Enforcement
- Tracking
- ...



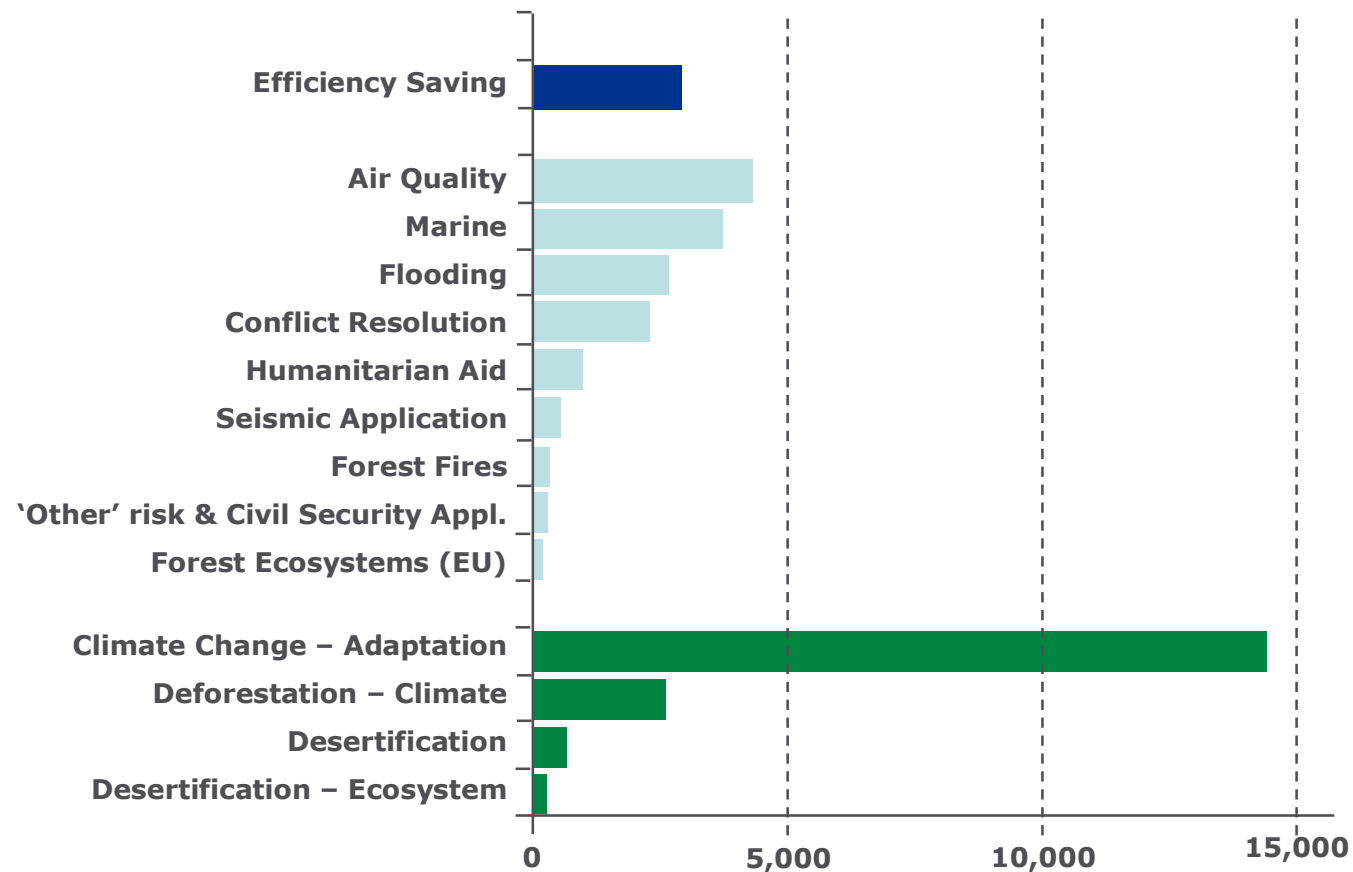
Expected benefits

- GMES benefits are inherently of “public good” nature
- Value of GMES depends on HOW THE INFORMATION IS USED
- Benefits:
 - Short term: support to the implementation of running policies and legislation
 - Medium Term: support to the definition and formulation of new policies
 - Longer Term: impacting the formulation and implementation of policies with a global reach

“Failing to act on climate change would reduce global GDP by at least 5% annually, while mitigation would use 1% of global GDP annually”,
Sir N. Stern, Former Chief Economist of the World bank.

Socio-economic benefits

Total benefits (up to 2030):



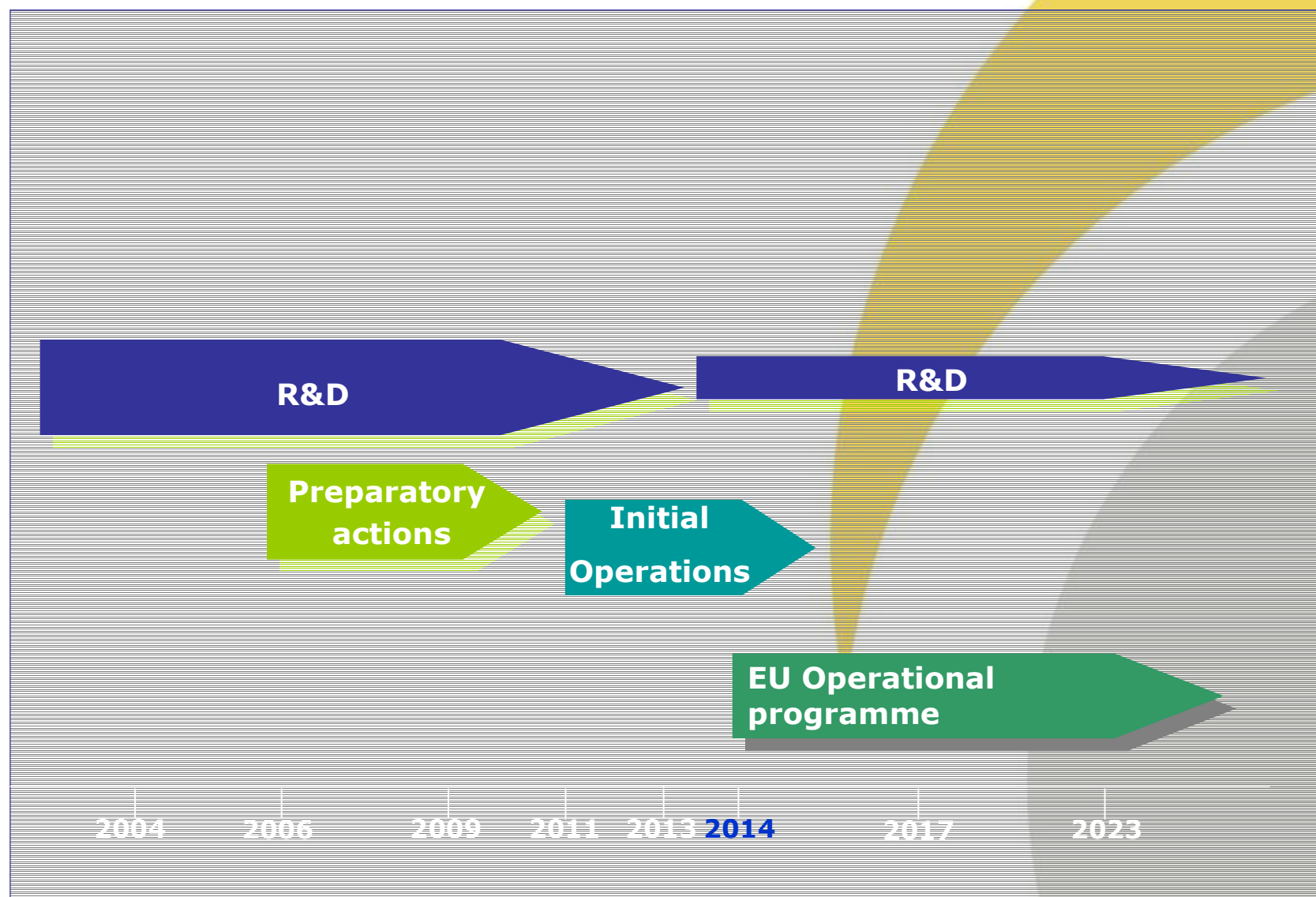
Cat.1
(Efficiency
Benefits):
2786 M€

Cat.2
(European
Policy
Formulation
Benefits):
14582 M€

Cat. 3
(Global
Action
Benefits):
17298 M€

Based on
PWC study

Evolution



Conclusion

- **GMES is an EU programme involving all Member States and providing services to all Member States**
- **GMES is implemented through public investment**
- **GMES has a positive impact on economy, growth, jobs and innovation**
- **Full and open data policy: key success factor**

For further information please visit

EC GMES website :
ec.europa.eu/gmes

ESA GMES website :
www.esa.int/esaLP/LPgmes.html

EU Space Research :
ec.europa.eu/enterprise/policies/space/research